

“Too-Big-To-Fail” or Full Deposit Insurance: Evidence from Turkey

Zeynep Önder* and Süheyla Özyıldırım
Bilkent University
Faculty of Business Administration

Abstract

This study examines the impact of full deposit insurance on the risk behavior of banks and investigates whether market discipline works under full deposit coverage. The analysis of Turkish banks over the period between 1988 and 2000 shows that moral hazard behavior of banks intensifies with generous insurance except for the big banks. Although the overall riskiness of banks increases, we have not observed any significant change in deposit withdrawals and increase in deposit interest rates. This implies that market discipline does not work with full insurance. However, we find that big banks increase their market shares with lower deposit rates during the sample period. Therefore, we could state that even if their deposits are completely guaranteed by law, Turkish depositors preferred to be under “too-big-to-fail” protection as well.

*Corresponding author: Zeynep Önder, Faculty of Business Administration, Bilkent University, 06533 Bilkent, Ankara, Turkey. Phone: +90-312-2902038. Fax: +90-312-2664958. E-mail: zonder@bilkent.edu.tr.

“Too-Big-To-Fail” or Full Deposit Insurance: Evidence from Turkey

Abstract

This study examines the impact of full deposit insurance on the risk behavior of banks and investigates whether market discipline works under full deposit coverage. The analysis of Turkish banks over the period between 1988 and 2000 shows that moral hazard behavior of banks intensifies with generous insurance except for the big banks. Although the overall riskiness of banks increases, we have not observed any significant change in deposit withdrawals and increase in deposit interest rates. This implies that market discipline does not work with full insurance. However, we find that big banks increase their market shares with lower deposit rates during the sample period. Therefore, we could state that even if their deposits are completely guaranteed by law, Turkish depositors preferred to be under “too-big-to-fail” protection as well.

1 Introduction

A series of banking crises observed in the developed and developing countries over the last decades has made the proper regulations of banking system and the provision of a safety net to depositors very crucial. Explicit deposit insurance is one of these safety net policies that have been widely accepted around the world.¹ Its primary intention is to deter bank runs and panics. The smaller and less informed savers would be protected from the reduction in wealth that would occur if that person were last in the line when a bank fails. Deposit insurance also helps small banks compete with the big banks.²

¹The application of deposit insurance changes widely in the world from implicit to the explicit full insurance of all bank liabilities. For the review of deposit insurance system in the world, see Garcia (1999). Demirgüç-Kunt and Sobaci (2002) provide a cross-country dataset characterizing deposit insurance agreements in 178 countries.

²See, for example, Diamond and Dybvig (1983), Grossman (1992), Bhattacharya, Boot and Thakor (1998), and Chen (1999).

Although there is wide acceptance on the incorporation of deposit insurance to the banking system, there is no unity in the best practice of the scheme. Yet, recent evidences show that explicit deposit insurance may affect bank stability adversely, i.e., increasing the probability of banking crises, and this adverse effect increases with the coverage of insurance (Demirgüç-Kunt and Detragiache 2002).³ Similarly, Cull, Senbet and Sorge (2002) assert that deposit insurance will lead to financial development and growth in sound regulatory environments but results in financial instability under lax regulatory environments. These studies indeed clarify the ambiguity on the ideal deposit insurance system to be country specific. It should be geared to balance between preventing crises and reinforcing market discipline. Although Martinez Peria and Schmukler (2001) show that deposit insurance does not decrease market discipline necessarily, systems such as blanket guarantees greatly undermine the market discipline and destabilize the financial markets over time (Demirgüç-Kunt and Kane, 2002).

Full insurance on bank deposits was experienced in Japan, Mexico (implicit) and Turkey for a considerable period of time.⁴ Among these countries, fully covered deposit insurance system in Turkey looks more similar to the blanket guarantee adopted after the Asian crisis in Thailand (1997), Malaysia (1998) and Indonesia (1998). Turkey adopted limited guarantee in 1983 and expanded to full coverage after the economic crisis in 1994. Although this was only a full insurance for the households' deposits, the common public belief is that all of the obligations of banks were under government guarantee. Recently by the crisis in 2000, the coverage became explicitly blanket guarantee which includes all domestic and foreign deposit and non-deposit obligations of the banks in Turkey. By January 2001, blanket guarantee was abolished and the deposit insurance coverage has been limited to 50 billion Turkish Liras (TL).⁵ Hence, after eleven years of explicit limited-coverage scheme,

³The sample of this study is very comprehensive, covering deposit insurance practices in 61 countries for the period between 1980 and 1997.

⁴There are other countries where full insurance is adopted for a while. According to Demirgüç-Kunt and Sobacı (2002), these are Colombia (until 2002), Ecuador (until 2001), Indonesia (until 2001), Japan (until 2002), Korea (until 2000), Malaysia, Mexico (until 2005), Thailand and Turkey (until 2001).

⁵This amount was approximately \$74,000 in January 2001. As of June 2003, it declined

the transition from implicit blanket guarantee back to limited coverage took another seven years in Turkey.

In this paper, we aim to study how moral hazard intensified and how the interests of depositors, creditors and banks eroded over time in Turkey with the introduction of extensive coverage. We will examine first, whether banks acted to increase their riskiness with full deposit insurance, and secondly, how the markets reacted and the banks performed after the change in deposit insurance coverage. Thus, we will show that as long as the time to restructuring the financial system and finding the appropriate design for a specific country is delayed, all the benefits of avoiding the collapse of or the loss of confidence to the system might disappear with the weakening of market discipline.

There are at least two views to identify the behavior of depositors as market discipline under generous guarantee and competition. According to the first view, depositors understand that there are more risk-loving banks in the sector and might hesitate to deposit their savings in risky banks even under full insurance. In the second view, depositors believe that their savings are going to be paid in full even if their bank fails, and thus they would be indifferent in their choice between safe and risky banks, and demand especially higher interest rates from risky banks. As a result, market discipline might prevail under full coverage, if the guarantor is perceived as non-credible or recovery costs are significant (Barajas and Steiner, 2000). Martinez Peria and Schmukler (2001) provided some evidence that there was still market discipline in Mexico during the period that the coverage was implicitly full for bank deposits. Here, we will argue the opposite result exists under explicit full insurance or implicit blanket guarantee because only the informed depositors would ask additional compensation for the possible inconvenience on their savings or withdraw their savings from risky banks. As a result, the generous and prolonged guarantees impair market discipline.

In Turkey, many risk-loving entrepreneurs entered the banking business by the introduction of full coverage scheme. Using the information provided from the 23 failed banks in Turkey during 1988-2001, we estimate the probability of failure and use it as a measure of risk instead of several risk

to \$35,000 because of the devaluation of TL against U.S. Dollar.

indicators.⁶ Our results indicate that the riskiness of banks increases with deposit insurance. Nonetheless, it seems that large banks are more prudent in terms of their risk taking behaviour under full deposit insurance. We find that moral hazard intensifies, market discipline weakens with the introduction of full deposit insurance. We also provide evidence regarding market reaction with respect to size, riskiness and ownership structure of banks.

The paper is organized as follows. In Section 2, the Turkish deposit insurance system is explained. Current literature on market discipline, empirical model and data are presented in Section 3. Results are reported in Section 4. Section 5 concludes the paper with a brief summary and some policy implications.

2 Deposit Insurance System in Turkey

The Turkish Deposit Insurance Fund was established in 1983. Since its establishment, the coverage of deposit insurance has changed many times. Initially, the maximum coverage was 3 million TL (or \$29,000) worth of deposit belonging to one person in one bank. In 1986, the insurance was limited only to initial deposits in domestic branches of all banks operating in Turkey, excluding the earned interest. In late 1980s and early 1990s, high inflation and depreciation of Turkish Lira accelerated the expansion of foreign currency (FX) denominated deposits.⁷ As a result, FX deposits were taken under the government guarantee in 1992 as well but the deposits on off-shore branches were excluded. Although the coverage was increased to 75 million TL (\$9,000), only two-third of this amount (50 million TL) was fully insured, the remaining (25 million TL) was only 60 percent insured.

The failure of three private banks in 1994, growing uncertainty in the economy and the resulting economic crisis in 1994 increased expectations regarding bank panics in Turkey. These developments led to the establishment of full deposit insurance in 1994 to cover both TL and FX denominated

⁶See Barajas and Steiner (2000) and Martinez Peria and Schmukler (2001) for risk indicators such as Capital/Assets, Non-performing Loans/Total Loans, Return/Assets etc.

⁷The average annual inflation and the appreciation of U.S. Dollar against TL were 69.1 and 72.6 percent respectively over the period between 1988 and 1994.

deposits. All deposit liabilities in the domestic and off-shore branches of local and foreign banks operating in Turkey have been undertaken to full government guarantee. After pursuing explicit deposit insurance for seven years, another economic crisis in 2000 compelled the introduction of further insurance, the blanket guarantee. Within short period, blanket guarantee was removed and in 2001, the deposit insurance coverage was limited to 50 billion TL (\$75,000).

The deposit insurance fund is officially managed. The funding is obtained from mandatory premiums paid by the banks in Turkey. Recently the premiums changed from fixed to risk adjusted ones. Thus, the insurance premium depends on the capital adequacy. If capital ratio is greater than 8 percent, the premium is 0.25 percent. It increases to 0.26 percent for banks with capital ratio less than 8 percent. Moreover, if the Fund needs additional capital, Central Bank will be the lender-of-last-resort.

3 Empirical Model

3.1 *Background*

Several studies have attempted to provide evidence of market discipline by examining interest rate paid on large certificates of deposit (Baer and Brewer, 1986; Hannan and Hanweck, 1988; Cargill, 1989; and Elis and Flannery, 1992) and subordinated notes and debentures (Flannery and Sorescu, 1996). The market's ability to recognize default risk in bank obligations are investigated in these papers. In particular, Flannery and Sorescu (1996) argue that pricing the effects of likely future changes in bank risk on bank liabilities is most valuable type of market discipline. In their study, the main hypothesis is that bank-specific risk measures explain the large proportion of the cross-sectional variation in the prices of subordinated notes and debentures (SNDs). However, in the literature there is no conclusive guidance about the proper functional relation between SND spreads and bank risk so that Flannery and Sorescu (1996) use three different empirical specifications to show that there is a relation between bank's balance sheet risk and SNDs prices.

In addition to interest rates, Park (1995) emphasizes that the incorporation of the quantity of uninsured funds in the analysis would make the market discipline argument more convincing. Hence, Park (1995), Park and Peristiani (1998), and Goldberg and Hudgins (2002) provide evidence of quantity and price effect of bank riskiness on the disciplining of the US banking. Similarly, Barajas and Steiner (2000) and Martinez Peria and Schumkler (2001) study these two effects in order to investigate the market discipline experiences of Argentine, Chilean, Colombia and Mexican banking systems. Most of these studies use the reduced form equations for testing the effect of bank riskiness on the growth of deposits and/or interest rates on those deposits. Park (1995) beholds that “It is difficult, however, to identify demand and supply equations due to lack of exogenous variables that are significant”. Hence, the prior works fail to provide any demand and supply relation to specify a simultaneous equations model. In this study, we also follow the similar empirical structure and use reduced form equations to examine the relationship among market discipline, deposit insurance and “too-big-to-fail” policy.

3.2 Estimating the Probability of Failure

Effective market discipline assumes that depositors are rational and predict the riskiness of banks from publicly available information and ask higher interest rates on their deposits or withdraw their savings from the risky banks. The researchers examining market discipline either estimate the riskiness of banks with probability of failure model (e.g., Park and Peristiani, 1998) or control for several risk measures (e.g., Martinez Peria and Schmukler, 2001). In this study, we follow the former strategy to determine the riskiness of the bank. We estimate the probability of bank failure using the following logit model:

$$F_t^i = f(X_{t-1}^i, E_{t-1}) \quad (1)$$

where F_t^i takes a value of 1 if bank i fails in year t and 0 otherwise. X_{t-1}^i and E_{t-1} represent vectors of variables for bank characteristics and economic conditions respectively. Two economic variables are included in the model:

CYCLE and *CRISIS*. The growth rate in real GDP (*CYCLE*) is used to control for business cycles. *CRISIS* is created to take into account the impact of crises on the probability of failure at time t . There were three economic crises in Turkey over the sample period from 1988 to 2000: 1991, 1994 and 2000. The crisis variable takes a value of 1 in these years and 0 in others.

We examine various financial ratios as bank characteristics, X_{t-1}^i . These are capital asset ratio⁸ (*CARATIO*), ratio of non-performing loans to total capital (*BADTK*), liquid assets to total deposits ratio (*LIQDEP*), share of short-term credits in total assets (*SHCREA*), before tax return on assets (*ROA*), expense ratio (*EXPENSE*), the difference between implied interest rates on credits and deposits (*SPREAD*).⁹ *GCRE*, the credit growth rate of bank i over the mean credit growth rate for the whole banking sector in year t , is also included in the model as a proxy for credit risk.¹⁰ *CARATIO* assesses the insolvency risk of an individual bank. Liquidity risk and profitability of bank are measured by *LIQDEP* and *ROA*, respectively. *BADTK* is used as a proxy for the quality of loans. *SHCREA* reflects the maturity of loans and creditors' confidence to the bank. The size of the bank, *SHASSET*, measured by the contribution of each bank to the total assets in the banking sector, is also controlled in the model. Thus, the probability of failure in year t is forecasted using the financial position of bank in year $t - 1$.

Table 1 presents the results of logit model for the 1988-2000 period. Although only three variables, *SHASSET*, *LIQDEP* and *CYCLE* are found to be significant, all of the variables have expected signs. The first result provides supporting evidence on "too-big-to-fail" argument in Turkey. As

⁸In calculating capital-asset ratio, total capital is defined as a summation of paid-in capital, retained earnings and net income for that year. Because of high inflation in Turkey, companies are allowed to revalue their fixed assets. The increase in assets side of balance sheet because of revaluation is reported as a revaluation fund in equity which artificially increase total capital. This item is removed from the calculation of capital.

⁹Similar indicators are used by Park and Peristiani (1998).

¹⁰As evidenced by Rojas-Suarez (2001), in the emerging economies such as Colombia, Korea, Malaysia, Mexico, Thailand and Venezuela, banks holding more loans in their portfolio relative to other banks are found to be more risky. In that study, spread is also found to be another indicator to differentiate risky banks in the developing countries.

Table 1. Results of Logit Model for Probability of Failure (F)

	Estimated Coefficient	Standard Error
<i>INTERCEPT</i>	3.449*	1.8798
<i>SHASSET</i>	-35.401**	16.9989
<i>CARATIO</i>	-2.6913	3.8191
<i>BADTK</i>	0.1752	0.2254
<i>LIQDEP</i>	-3.1022***	1.1784
<i>SHCREA</i>	-0.6941	2.2078
<i>ROA</i>	-3.9499	4.7301
<i>EXPENSE</i>	0.5786	1.042
<i>SPREAD</i>	1.6203	1.2693
<i>GCRE</i>	-0.0473	0.1642
<i>CYCLE</i>	-4.9803***	1.7673
<i>CRISIS</i>	0.0888	0.5998
Log Likelihood	-64.496	

*, **, and *** denote statistical significance at the 10%, 5%, and 1% levels respectively.

the relative size of banks increases, the probability of failure declines significantly. Moreover, an increase in capitalization and a decrease in the proportion of non-performing loans reduce bank i 's failure probability. If banks have less liquidity risk (more liquid assets relative to their deposits), they are less likely to fail. Furthermore, if the economy is booming, we find that probability of bankruptcy significantly lessens. On the other hand, this probability increases during the crisis period as expected. For the following analyses of moral hazard, market discipline and bank performances, we will use the predicted probability of failures from this model as a measure of bank riskiness in addition to other risk measures.

3.3 *Estimating Moral Hazard*

One of the widely accepted disadvantages of full deposit insurance is that it tends to intensify moral hazard. In this study, we use five different risk measures to examine the moral hazard behavior of banks. These are capital-to-assets ratio (*CARATIO*) as a measure of capital adequacy, the ratio of past due loans to total loans (*BADLOANS*) as a measure of delinquency risk or asset quality indicator, the ratio of liquid assets to total deposits (*LIQDEP*) as an indication of liquidity risk, the predicted probability of failure (F^e) to measure the total risk of the bank, and finally, the difference between implicit interest rates on credits and deposits (*SPREAD*) as a measure of credit and interest rate risk. We use spread because according to Wong (1997) and Rojas-Suarez (2001), the bank interest margin is positively related to the degree of credit risk and interest rate risk. Both studies show that risky banks have wider interest margin, although empirically Angbazo (1997) find mixed results with the relation between interest margins and risks.

In the model, other factors that might affect the risk taking behavior of banks are controlled. One of these factors is *SIZE*. In order to be consistent with the existing literature, we use the natural logarithm of total assets expressed in terms of 1987 prices as an absolute asset size of a bank in estimating all risk measures except *CARATIO*.¹¹ The relative size measure *SHASSET* is used in the estimation of capital-to-assets ratio because of high correlation between *CARATIO* and logarithm of total assets.

There are three types of banks operating in Turkey according to their ownership: Private banks, state banks and foreign banks founded in Turkey.¹² Since these banks are exposed to different regulations and internal control, we measure the ownership type of a bank with two dummy variables: *STATE* and *FOREIGN* representing state and foreign ownership respectively. Some

¹¹We also estimate all of the models with the relative measure of size (*SHASSET*), instead of logarithm of total assets. The results are similar to those reported in the paper. These results are available from the authors upon request.

¹²We exclude foreign banks that have branches in Turkey because they have limited banking activity and their branches in Turkey may not represent the actual characteristics of these banks.

banks are listed on the Istanbul Stock Exchange (ISE). We use a dummy variable, *LISTING*, to identify these banks. Since they are exposed to more regulations, we expect them to be less risky than the non-listed ones. The age of a bank, *AGE*, is also studied in the model to determine the risk taking behavior of the experienced banks.

In addition to bank characteristics, the economic conditions, E_t have to be controlled in analyzing the moral hazard behavior of banks. Aforementioned, two economic variables: *CYCLE*, and the crisis dummy variable, *CRISIS* are included in the model. It is expected that in a growing economy, the riskiness of banks will be lower. However, during the crisis period, safer borrowers may be unwilling to borrow at high lending rates, so that the mix of borrowers within the pool becomes riskier. Hence, unprudent banks might face more adverse selection. Moreover, the borrowers of these banks might intend to invest more risky projects to pay their costly bank obligations and cause moral hazard problem.

Hence, the following reduced form model is estimated to determine whether moral hazard is observed with the introduction of full deposit insurance:

$$Risk_t^i = f(DI_t, BANK_t^i, E_t), \quad (2)$$

where $Risk_t^i$ represents a vector with variables: *CARATIO*, *BADLOANS*, *LIQDEP*, F^e and *SPREAD*. *DI* is a dummy variable taking a value of 1 for the years with full deposit insurance, i.e., 1994-2000. $BANK_t^i$ is also a vector of control variables: *SIZE*, *STATE*, *FOREIGN*, *LISTING*, and *AGE*.

It is hypothesized that risk measures, *BADLOANS*, *LIQDEP*, F^e and *SPREAD*, will be higher in the explicit full deposit insurance period than those in partial insurance period. However, banks are expected to have lower capital-to-assets ratio (*CARATIO*) in the full insurance period under moral hazard. In addition to the model (Model I) specified in equation (2), we add an interaction variable between DI_t and *SIZE* and estimate how the impact of size on the riskiness of banks changes with the application of full deposit insurance (Model II). It is expected that bigger banks will not show moral hazard behavior compared to others.

3.4 *Estimating Market Discipline and Bank Performance*

The market reaction under full insurance scheme is studied with the following reduced form model (Model I):

$$\text{Market Reaction}_t^i = f(DI_t, \text{BANK}_t^i, E_t) \quad (3)$$

where $\text{Market Reaction}_t^i$ represents both the market discipline and bank performance measures over the sample period. The bank characteristics, BANK_t^i , include size, risk (predicted probability of failure), ownership type, listing status on the ISE, age and the number of branches. The last three variables can also be used as proxies for the visibility of banks and it might affect not only the bank's ability to collect deposits or provide credits but also its performance.

In addition to the traditional measures of market discipline, the growth rate of real deposits ($GDEPR$) and the implicit interest rate on deposits calculated by dividing total interest paid on deposits by total bank deposits ($IDEP$), we analyze the share of each bank's deposits within the whole market ($SHDEP$), the share of each bank's loans in the loan market ($SHCRE$) and the growth rate of real credits ($GCRER$). When the depositors are exposed to bank risk taking, they may penalize riskier banks by withdrawing their deposits and/or requiring higher interest rates. In the previous studies, only the growth rate of real deposits and the implicit interest rate on deposits are considered to test market discipline. However, we will also investigate how an individual bank's deposit share is affected because of the increase in the riskiness of bank as perceived by the savers in the market. Thus, we aim to measure if any hesitation of depositors to particular banks can be seen within the overall amount of deposits collected by the banking sector.

Moreover, we study the borrowers' role in bank discipline as a part of market reaction. The long-term relationship between banks and creditors is crucial to reduce adverse selection. Yet, there are two types of adverse selection in this relation. First, banks prefer to lend to customers they know in order to eliminate the bad loans in their creditor pool. Second, borrowers seek loans from safe banks in order to have durable bank relationship which

help them to lower borrowing costs in the future (see Slovin, Sushka, and Polonchek, 1993; Berger and Udell, 1995). Especially for small firms, the switching costs under bank failure will be very high since their reputation is not sufficient to obtain credit from many sources. Hence, the role of creditors in market discipline and whether there is significant change in rate of loan provisions for risky banks are examined under full insurance period. We expect that if market disciplines, risky banks have lower loan growth, lower deposit growth, lower loan share, lower deposit share and offer higher interest rates on deposits than other banks.

In order to analyze how bank performance changes under generous guarantee period, we use four variables: before tax return on assets (*ROA*), net interest income as a percent of investment securities and loans (*NII*), non-bank revenue as a percent of total revenues (*NONBANKREV*), and return on loans (*RLOAN*). The first variable is a measure of profitability of the banks and the others can be considered as operating efficiency indicators (Cornett, Ors, and Tehranian, 2002).

As a second model (Model II) an interaction variable is created between risk measure (predicted probability of failure, F^e) and full deposit insurance dummy variable, *DI*, to examine how the relationship between risk and the market discipline and that between risk and the performance of banks evolve with the introduction of extensive insurance. If market disciplines, risky banks will lose their deposit and loan shares and have lower growth on their deposits and on their credits with full deposit insurance and/or these banks are expected to offer higher interest rates on deposits. Hence, the coefficients on the interaction variable is hypothesized to be negative in the model with deposit share, loan share, deposit growth and credit growth but positive in the interest rate model. Moreover, since the risky banks are expected to offer higher interest rates to attract depositors, we hypothesize to observe a negative coefficient on risk in the estimation of profitability (*ROA*) and operating efficiency measures (*NII*). Additionally, another interaction variable between *SIZE* and *DI* is included in the model in order to investigate whether the effect of size on market discipline and bank performance changes after 1994.

3.5 *Data and Sample*

In this paper, the sample period is between 1988 and 2000. The beginning of this period is determined by the electronic availability of the bank data. Since deposit insurance coverage has changed from full to the limited coverage and the new supervisory authority, Banking Regulation and Supervision Agency started to regulate the banking sector in 2001, we ended our sample period in 2000. The data are obtained from the Yearbooks of Turkish Banking Association (TBA). Every year TBA provides the audited financial statements of domestic and foreign banks operating in Turkey.

Only commercial banks are considered in the analysis. The number of banks changes over time because of the establishment of new banks and the failure of existing ones. Table 2 shows the number of banks included in the sample over time.¹³ Twenty-three banks failed in this period with the majority of failures around the crisis periods especially in 2001.

Table 3 presents the descriptive statistics of the variables used in the estimations. We divide the sample into two subperiods. Until 1993, deposits were partially covered and then full coverage was adopted. The mean values

Table 2. Distribution of Banks between 1988 and 2001

Years	1988-90	91	92	93	94	95	96	97	98	99	2000	2001
Total	42	43	45	46	41	44	43	45	43	37	36	27
Failed	0	0	2	0	3	0	0	1	1	4	2	10

During 1988-1990, no change in number of banks.

of all of the risk indicators in these two subperiods before and after full deposit insurance change significantly as hypothesized for the case where banks undertake moral hazard behavior. We observe that the mean capital asset ratio (*CARATIO*) and liquid assets-to-deposits ratio (*LIQDEP*) decrease in the second part of the sample period indicating increase in risk. Similarly, the ratio of non-performing loans (*BADLOAN*), the predicted probability of failure (F^e) and the interest rate margin (*SPREAD*) increase during the full insurance period.

¹³Imar Bank is excluded from the sample because of the recent disclosure about the manipulation of its accounts although it did not fail during our sample period.

Table 3. Summary Statistics of Variables

	1988-2000		1988-1993		1994-2000	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Risk Measures						
<i>CARATIO</i>	0.0951	0.2160	0.1235	0.1086	0.0724	0.2710
<i>BADLOAN</i>	0.1364	0.7243	0.0453	0.0731	0.2088	0.9628
<i>LIQDEP</i>	1.1915	2.6557	1.5490	3.7183	0.9053	1.2134
<i>SPREAD</i>	0.1731	0.1993	0.1433	0.1666	0.1967	0.2193
<i>F^e</i>	0.0481	0.1022	0.0313	0.0409	0.0595	0.1268
Bank Performance						
<i>ROA</i>	0.0124	0.2068	0.0369	0.0425	-0.0072	0.2733
<i>NII</i>	0.1994	0.3031	0.1614	0.3525	0.2300	0.2530
<i>NONBANKREV</i>	0.0841	0.9978	0.0903	0.2630	0.0790	1.3210
<i>RLOAN</i>	1.0135	2.0816	0.6611	1.2983	1.2951	2.5065
Market Reaction						
<i>GDEPR</i>	0.5917	1.8639	0.4773	1.2748	0.6661	2.1614
<i>SHDEP</i>	0.0235	0.0401	0.0243	0.0427	0.0228	0.0379
<i>IDEP</i>	0.1963	0.1341	0.1914	0.1348	0.2001	0.1337
<i>GCRER</i>	0.4622	2.1694	0.3728	0.8702	0.5202	2.6958
<i>SHCRE</i>	0.0235	0.0414	0.0243	0.0452	0.0228	0.0381
Control Variables						
<i>SHASSET</i>	0.0235	0.0374	0.0243	0.0399	0.0228	0.0354
<i>TOTAL ASSETS[†]</i>	1448.37	2470.60	1008.39	1655.24	1802.37	2923.40
<i>BADTK^{††}</i>	0.0130	3.7359	0.2171	0.4694	-0.1492	4.9852
<i>SHCREA</i>	0.3066	0.1496	0.3417	0.1480	0.2783	0.1451
<i>EXPENSE</i>	0.2192	0.2308	0.1202	0.0699	0.2972	0.2788
<i>GCRE</i>	3.4349	40.9140	1.1744	1.4019	4.9072	52.5456
<i>FOREIGN</i>	0.1632	0.3699	0.2214	0.4160	0.1156	0.3203
<i>STATE</i>	0.1254	0.3315	0.1527	0.3604	0.1031	0.3046
<i>LISTING</i>	0.2259	0.4185	0.1794	0.3844	0.2642	0.4416
<i>BRANCH</i>	148.8328	262.8095	146.8842	272.1476	150.4349	255.3008
<i>AGE</i>	38.9021	34.4493	37.0420	33.6598	40.4250	35.0614
Economic Variables						
<i>CYCLE</i>	0.7814	0.1522	0.7333	0.0643	0.8221	0.1889
<i>CRISIS</i>	0.2260	0.4186	0.1641	0.3711	0.2781	0.4488
<i>N</i>	549		247		302	

[†] In billion TL. ^{††}The negative mean value of *BADTK* is due to large losses incurred by some banks.

Significant differences are observed for all of the bank performance measures before and after full insurance periods except return from non-banking activities. Although return on assets (*ROA*) and return from non-banking activities (*NONBANKREV*) are lower, net interest incomes (*NII*) and return on loans (*RLOAN*) grow in the second sub-period. This suggests that even though banks do not operate efficiently, they earn more revenue from loans and government securities than deposit expenses.

None of the market reaction variables are found to change significantly after 1994. It is observed that the real growth rate on deposits (*GDEPR*) is higher during the full deposit insurance period. Similarly, interest rates on deposits (*IDEP*) are found to be higher in this period. However, the decline in the mean value of share of deposits (*SHDEP*) of banks following the full coverage suggests the increase in the competition in the deposit market. The real growth rate on credits (*GCRER*) is lower than the real growth rate on deposits in both periods but the difference is larger in the second subperiod. In this period, the Turkish government started to issue both Treasury bills and government bonds and banks are the major investors on the securities market.

The mean values indicate that the share of short term credits (*SHCREA*) declines, total assets in terms of 1987 prices (*TOTAL ASSETS*) and expense ratios (*EXPENSE*) increase significantly in the second subperiod. More banks are listed on the ISE after 1994 even though some of the listed banks failed in the full insurance period. The number of both foreign banks founded in Turkey and state banks decreases in the second half of the sample period.

4 Results

4.1 Moral Hazard

Table 4 summarizes the results of the hypotheses on moral hazard during 1988-2000.¹⁴ As expected, there are significant indications that generous deposit insurance created moral hazard: Capital-to-assets ratio decreases,

¹⁴All of the models specified in equations (2) and (3) are estimated using Generalized Method of Moments (GMM) because of having unbalanced panel data.

Table 4. Moral Hazard Model

	CARATIO		BADLOAN		LIQDEP		SPREAD		F^e	
	Model I	Model II	Model I	Model II	Model I	Model II	Model I	Model II	Model I	Model II
<i>INTERCEPT</i>	-0.0398 (0.0718)	-0.0295** (0.0693)	1.0168*** (0.3260)	0.8244*** (0.2559)	0.9775* (0.5762)	1.2154** (0.6020)	0.2043*** (0.0626)	0.1298** (0.0641)	0.0851*** (0.0205)	0.0825*** (0.0174)
<i>DI</i>	-0.0752*** (0.0221)	-0.0917*** (0.0272)	0.2620*** (0.0803)	0.7204** (0.2851)	-0.5012** (0.2514)	-1.0790 (0.7253)	0.0358* (0.0202)	0.2135** (0.0923)	0.0286*** (0.0084)	0.0326 (0.0286)
<i>SIZE</i>	0.1971 (0.2946)	-0.1225 (0.2776)	-0.0581** (0.0245)	-0.0171 (0.0111)	0.0530 (0.0927)	0.0020 (0.0910)	-0.0130 (0.0079)	0.0029 (0.0075)	-0.0056 (0.0040)	-0.0052** (0.0036)
<i>SIZE * DI</i>		0.6991** (0.2773)		-0.0741** (0.0356)		0.0933 (0.0871)		-0.0286** (0.0126)		-0.0007 (0.0039)
<i>LISTING</i>	-0.0257 (0.0252)	-0.0275 (0.0252)	-0.1101* (0.0598)	-0.1008* (0.0584)	-0.1073 (0.1246)	-0.1192 (0.1258)	-0.0014 (0.0161)	0.0021 (0.0160)	-0.0335*** (0.0127)	-0.0335*** (0.0127)
<i>AGE</i>	-0.0009*** (0.0003)	-0.0009*** (0.0003)	0.0026*** (0.0011)	0.0026** (0.0011)	-0.0099*** (0.0037)	-0.0098*** (0.0037)	0.0001 (0.0002)	0.0001 (0.0002)	0.0000 (0.0002)	0.0000 (0.0002)
<i>STATE</i>	-0.0382 (0.0283)	-0.0418 (0.0282)	-0.0909 (0.0705)	-0.0915 (0.0694)	-0.2222 (0.1547)	-0.2221 (0.1541)	-0.1162*** (0.0002)	-0.1167*** (0.0002)	-0.0270* (0.0002)	-0.0271* (0.0002)
<i>FOREIGN</i>	-0.0062 (0.0162)	-0.0084 (0.0160)	-0.0883 (0.0681)	-0.0703 (0.0642)	2.2248*** (0.6922)	2.2036*** (0.6859)	-0.1070*** (0.0364)	-0.1019*** (0.0369)	-0.0534*** (0.0109)	-0.0533*** (0.0106)
<i>CYCLE</i>	0.2736*** (0.0944)	0.2731*** (0.0940)	-0.9538*** (0.3051)	-1.0194*** (0.3254)	0.3858 (0.4281)	0.4680 (0.4408)	0.0492 (0.0645)	0.0240 (0.0626)		
<i>CRISIS</i>	0.0221 (0.0271)	0.0220 (0.0271)	0.1138 (0.0841)	0.1031 (0.0820)	-0.1248 (0.1242)	-0.1106 (0.1235)	0.0771*** (0.0244)	0.0721*** (0.0246)		
Adj. R^2	0.0560	0.0580	0.0688	0.0735	0.1176	0.1167	0.0997	0.1104	0.0549	0.0529

Standard errors are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels respectively.

the proportion of non-performing loans increases and banks have less liquid assets with respect to their deposit liabilities during the full deposit insurance period. Furthermore, the spread widens and the probability of failure significantly increases after 1994.

The relationship between size¹⁵ and measures of risk suggests that larger banks are more conservative in risk taking. As size increases, bad loans, spread and probability of failure decline, and liquidity increases but only the coefficient on size for *BADLOAN* is found to be significant (see Model I). Yet, large banks significantly improve their capitalization with the introduction of implicit blanket guarantee (see Model II). However, these banks have significantly less bad loans and lower probability of failure in the second sub-period. In addition, as the size of the bank increases, the spread significantly declines during the full insurance scheme. In our analysis reported in section 4.2, we find that deposit rates significantly decrease in large banks. The narrow spread implies that large banks seem to lend to safer borrowers. Hence, we interpret the overall findings that during the period of generous guarantee large banks act more prudently.

Banks traded in the stock market have lower moral hazard problem which can be explained by heavier regulations imposed by the Capital Markets Board who monitors all traded companies on the Istanbul Stock Exchange, and additionally the pressure exercised by the existing and potential stockholders. They have significantly less bad loans and their probability of failure is lower than non-listed banks. The coefficients on *AGE* variable suggest that banks with long history hold more non-performing loans and keep less liquid assets relative to their deposits. Thus, we can argue that durability in the market is sufficient to handle risk. Both state and foreign banks have significantly narrow spread with lower probability of failure. Moreover, in the expense of profitability (see results in Table 6), foreign banks choose to be more liquid during the sample period.

Finally, with economic expansion, we observe that capital-asset ratio increases and bad loans decrease significantly. However, spread increases sig-

¹⁵Aforementioned, the share of bank's asset in total assets of the banking sector is used as a proxy for size in the estimation of *CARATIO* and return on asset *ROA*.

nificantly in the crisis period.¹⁶ Widening of the interest margins indicates higher exposure of banks to credit risk leading to an increase in the probability of failure.

4.2 *Market Reaction*

The empirical results of the markets reaction to full insurance scheme are summarized in Tables 5 and 6. In our analysis with traditional variables (see the first four columns of Table 5), we do not observe any indication for market discipline. There is no significant decline in the growth rate of real deposits (*GDEPR*) and no evidence for growing interest rate on deposits (*IDEP*) during the full deposit insurance period. Furthermore, we do not find any significant relationship between the growth of real deposits and the risk of a bank.

There is a negative relationship between size of banks and interest rates on deposits but this coefficient increases during the generous insurance period. On the other hand, we find that as riskiness of banks increases, they offer significantly high interest rates suggesting market discipline. However, this discipline does not continue with full insurance, the decrease is not found to be significant.

Moreover, the share of each bank in the deposit market tends to decline significantly after 1994 controlling for size, risk and other bank characteristics. This result provides evidence that full deposit insurance increases the competition in the market. Yet, as size increases, it is found that deposit shares of banks increase even with lower interest rates on deposits. The improvement of the deposit shares of big depository institutions did not continue further after the complete insurance regime. Moreover, as risk of a bank increases, its share in deposit market significantly declines. Nevertheless, with full deposit insurance we observe an increase in the impact of risk on the deposit share (*SHDEP*).

With respect to loan growth (*GCRER*) and share (*SHCRE*), no significant impact of full deposit insurance is observed. However, large banks

¹⁶We exclude the economic variables in the empirical model of probability of failure since these variables are already used in the estimation of F^e .

Table 5. Market Reaction Model: Market Discipline

	<i>GDEPR</i>		<i>IDEP</i>		<i>SHDEP</i>		<i>SHCRE</i>		<i>GCRER</i>	
	Model I	Model II	Model I	Model II	Model I	Model II	Model I	Model II	Model I	Model II
<i>INTERCEPT</i>	-0.1920 (0.7665)	-0.7480 (1.0225)	0.2205*** (0.0609)	0.2649*** (0.0731)	-0.0285*** (0.0059)	-0.0300*** (0.0074)	-0.0293*** (0.0092)	-0.0281*** (0.0098)	0.9997 (0.7706)	0.8626 (1.0346)
<i>DI</i>	0.1581 (0.1815)	1.1133 (0.7229)	0.0124 (0.0167)	-0.0700 (0.0851)	-0.0038** (0.0018)	0.0000 (0.0076)	-0.0032 (0.0026)	-0.0034 (0.0135)	0.2982 (0.2117)	0.5584 (0.7344)
<i>SIZE</i>	0.0449 (0.0780)	0.1389 (0.1163)	-0.0113 (0.0075)	-0.0201** (0.0095)	0.0042*** (0.0008)	0.0047*** (0.0013)	0.0050*** (0.0015)	0.0052*** (0.0020)	-0.0721 (0.0793)	-0.0435 (0.1152)
<i>SIZE * DI</i>		-0.1368 (0.0962)		0.0132 (0.0111)		-0.0008 (0.0015)		-0.0004 (0.0025)		-0.0429 (0.0950)
<i>F^e</i>	-0.7880 (0.5238)	2.0172 (2.9267)	0.1642** (0.0795)	0.1722 (0.2916)	-0.0088 (0.0055)	-0.0444** (0.0188)	-0.0189** (0.0074)	-0.0955*** (0.0303)	-1.4666** (0.5814)	-1.7164 (2.0591)
<i>F^c * DI</i>		-3.0145 (2.9847)		-0.0019 (0.2880)		0.0370** (0.0184)		0.0803*** (0.0298)		0.2409 (2.0367)
<i>LISTING</i>	-0.3125* (0.1675)	-0.2949* (0.1678)	-0.0317** (0.0144)	-0.0325** (0.0146)	-0.0039** (0.0017)	-0.0040** (0.0017)	-0.0189** (0.0074)	-0.0955*** (0.0303)	-0.1726 (0.1603)	-0.1709 (0.1598)
<i>BRANCH/100</i>	-0.0530 (0.0381)	-0.0540 (0.0386)	0.0078** (0.0031)	0.0082*** (0.0031)	0.0121*** (0.0009)	0.0121*** (0.0009)	0.0107*** (0.0014)	0.0106*** (0.0013)	-0.0007 (0.0006)	-0.0007 (0.0006)
<i>AGE/100</i>	-0.8740*** (0.2790)	-0.8990*** (0.2830)	0.0411* (0.0242)	0.0415* (0.0237)	0.0006 (0.0022)	0.0008 (0.0022)	0.0051 (0.0036)	0.0057 (0.0036)	-0.0021 (0.0032)	-0.0021 (0.0032)
<i>STATE</i>	0.1728 (0.4313)	0.1733 (0.4320)	0.0665*** (0.0200)	0.0664*** (0.0202)	0.0055 (0.0041)	0.0055 (0.0040)	0.0048 (0.0056)	0.0048 (0.0055)	0.5461 (0.7666)	0.5466 (0.7674)
<i>FOREIGN</i>	0.2421 (0.4300)	0.2931 (0.4462)	0.0483 (0.0351)	0.0452 (0.0347)	0.0009 (0.0009)	0.0009 (0.0010)	0.0005 (0.0014)	0.0001 (0.0015)	-0.1820 (0.4813)	-0.1736 (0.5054)
<i>CYCLE</i>	1.1769* (0.6122)	1.0578* (0.5728)	-0.0021 (0.0472)	0.0086 (0.0474)	0.0121** (0.0048)	0.0115** (0.0049)	0.0071 (0.0080)	0.0070 (0.0084)	0.1584 (0.6171)	0.1243 (0.5713)
<i>CRISIS</i>	-0.0530 (0.1816)	-0.0976 (0.1839)	-0.0085 (0.0146)	-0.0072 (0.0157)	0.0027** (0.0013)	0.0029** (0.0013)	0.0031 (0.0020)	0.0039* (0.0020)	-0.4294*** (0.1411)	-0.4313*** (0.1485)
Adj. <i>R</i> ²	0.0387	0.0384	0.0987	0.1001	0.9147	0.9151	0.7924	0.7939	0.0125	0.0085

Standard errors are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels respectively.

increase their loan share significantly in the overall loan market. Moreover, it is found that as risk of a bank increases, the growth rate of loan provisions declines significantly suggesting that creditors prefer to operate with less risky banks.¹⁷ The significant negative relation between loan shares and riskiness of banks can also be an indication of market discipline from asset side. During the full government protection to depositors, risky banks significantly improve their loan shares. It suggests that these banks with no bank run possibility convince their borrowers to provide more loan. Hence, this result can be interpreted as an undermining impact of deposit insurance regime in Turkey on market discipline. In summary, we find weak signals of market discipline in Turkey from both liability and asset side. More strikingly, larger banks are favored more with the increase in their market shares. So, even though the deposits are guaranteed by law, savers prefer to be under “too-big-to-fail” protection as well.

We also discern that market is not rewarding for the listed firms. Since they offer significantly lower interest rate, their deposit growth rate and market shares in deposit are significantly smaller than non-listed banks. Banks with larger branch network significantly improve their deposit and loan shares within the whole savings market and as the number of branches increases, the implied interest rate (*IDEP*) increases as well. It is found that as age increases, deposit growth rate declines even though older banks offer significantly higher interest rates. State banks have significantly higher interest rates than private banks. Although they have extra coverage of government protection, we fail to detect significant growth in their deposits.

Market seems to react positively in the good economic conditions. In the amelioration of the general well-being, deposit shares increase significantly even without any significant change in the interest rates. Nevertheless, one prominent result is that banks also increase their deposit shares significantly during the crisis periods. This can be explained by the transfer of wealth from other financial markets such as stock markets to safe havens like banks. The only variable that significantly affects the loan provisions is *CRISIS* and the impact is negative as expected.

¹⁷However, the inference from this model (*GCRER*) about market discipline should be taken cautiously because of low R^2 .

Table 6. Market Reaction Model: Bank Performance

	ROA		NII		NONBANKREV		RLOAN	
	Model I	Model II	Model I	Model II	Model I	Model II	Model I	Model II
<i>INTERCEPT</i>	0.1284*** (0.0352)	0.1220*** (0.0308)	0.7680*** (0.2088)	0.7323*** (0.2886)	-0.3055 (0.6118)	-0.1213 (0.4375)	4.0772*** (1.9787)	3.1260* (1.7217)
<i>DI</i>	0.0236*** (0.0066)	0.0339** (0.0140)	0.1446*** (0.0289)	0.2406 (0.2281)	-0.1201 (0.0849)	-0.4224 (0.3816)	0.9236*** (0.3469)	2.7529** (1.2236)
<i>SIZE</i> [†]	-0.3739 (0.2320)	-0.2672 (0.2027)	-0.0844*** (0.0320)	-0.0708 (0.0454)	-0.0135 (0.0310)	-0.0416** (0.0197)	-0.4298** (0.1780)	-0.2261 (0.1543)
<i>SIZE * DI</i>		-0.1831 (0.1473)		-0.0217 (0.0304)		0.0400 (0.0361)		-0.3069** 0.1436
<i>F^e</i>	-0.6147*** (0.1894)	-0.4641*** (0.1143)	-0.5918*** (0.1972)	-1.7343*** (0.7651)	3.1110 (2.7256)	1.6356*** (0.4626)	0.8202 (3.4352)	-1.8255 (3.0738)
<i>F^e * DI</i>		-0.1612 (0.2029)		1.1891 (0.7827)		1.5695 (2.7233)		2.6254 (3.8474)
<i>LISTING</i>	0.0025 (0.0065)	0.0034 (0.0062)	0.0939* (0.0513)	0.0913* (0.0481)	0.0123 (0.0453)	0.0049 (0.0427)	0.0573 (0.2230)	0.0666 (0.2158)
<i>BRANCH/100</i>	0.0030 (0.0022)	0.0032 (0.0023)	0.0067 (0.0091)	0.0044 (0.0089)	0.0180* (0.0092)	0.0173* (0.0093)	0.0516 (0.0656)	0.0382 (0.0628)
<i>AGE/100</i>	-0.0320*** (0.0120)	-0.0330*** (0.0121)	-0.0370 (0.0657)	-0.0300 (0.0706)	0.2250*** (0.0847)	0.2371** (0.0965)	-0.0190 (0.3120)	-0.0110 (0.3170)
<i>STATE</i>	-0.0124 (0.0109)	-0.0120 (0.0110)	0.1230 (0.1548)	0.1235 (0.1542)	0.0335 (0.0557)	0.0335 (0.0578)	1.0535 (0.7409)	1.0571 (0.7409)
<i>FOREIGN</i>	-0.0001 (0.0103)	0.0013 (0.0098)	0.0549 (0.0481)	0.0523 (0.0533)	0.0401 (0.1036)	0.0208 (0.0856)	0.0880 (0.3864)	0.1422 (0.3673)
<i>CYCLE</i>	-0.0763** (0.0349)	-0.0780** (0.0358)	-0.1651* (0.0888)	-0.1794** (0.0905)	0.2944 (0.4520)	0.3311 (0.4851)	-1.5066 (1.3269)	-1.7483 (1.3978)
<i>CRISIS</i>	0.0052 (0.0071)	0.0036 (0.0073)	0.0195 (0.0274)	0.0295 (0.0239)	-0.0410 (0.0376)	-0.0209 (0.0468)	0.1947 (0.2393)	0.1910 (0.2371)
Adj. <i>R</i> ²	0.4635	0.4643	0.1423	0.1516	0.1671	0.1676	0.0757	0.0846

Standard errors are presented in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels respectively.

[†]Size is measured with *SHASSET* in the estimation of *ROA*.

The evolution of the banks' performances during the full insurance period is presented in Table 6. We find that banks significantly increase their before tax return on assets (ROA) after generous guarantee, especially net interest income as a percent of investment securities and loans (NII) and return on loans ($RLOAN$) improve significantly. Yet the non-bank revenues ($NONBANKREV$) declines with full insurance controlling for size, risk and other bank characteristics. Large banks have lower return on assets and as their size increases, their net interest return declines significantly. These findings do not change significantly in the full insurance period. However, risky banks perform poorly in terms of return on asset and net interest income but better in terms of their non-bank revenue with respect to other revenues. As riskiness of banks increases, their profitability declines significantly. Nevertheless, no significant change in these coefficients are observed in the full deposit insurance period.

With respect to control variables, age is found to be a significant factor in explaining bank performance. As age of bank increases, although their non-bank revenues increases, their overall return (ROA) declines significantly. When banks are compared in terms of their ownership structure, we fail to find any significant change in their performance. On the other hand, listed banks generate significantly more revenue from banking activities (NII).

Last result is the impact of economic conditions on the performance of banks. We find that banks' profitability is adversely affected from the economic growth. Although the deposits grow ($GDEPR$) with good economic conditions, we could not find any significant improvements in the return on loan provisions ($RLOAN$) and significant declines on overall returns and return from banking activities. Furthermore, it is found that the performance of banks does not change during the crisis years.

5 Conclusion

This study examines the impact of full deposit insurance on the risk behavior of banks and their performance and whether market discipline works under full deposit coverage. Our results suggest that the regulators should be very careful in granting full insurance to the banks. Although the objective of the

deposit insurance is to eliminate the risk of bank runs, the generous provision of this safety net further increases the overall riskiness in the banking sector. As emphasized by Demirgüç-Kunt and Detragiache (2002), not full but even an explicit deposit insurance reduces the economic development by making banking sector more fragile.

The analysis of Turkish banks over the period between 1988 and 2000 shows that banks' moral hazard intensifies with generous insurance. Although capital adequacy, the asset quality, the liquidity and the interest rate risks of banks worsen with full insurance, large banks are found to be more prudent in terms of handling their risk. Furthermore, it is observed that with the introduction of full deposit insurance, weak signs of market discipline in Turkey disappears. The negative and significant impact of risk on the deposit and the loan shares of banks diminishes during generous coverage.

One reason for the disappearance of the market discipline in Turkey is that full insurance has been applied over six years. This duration might too long for market to discipline banks. However, full insurance increased the collected deposits in banks over time so that these deposits have been used to finance public deficits through the government debt securities. This financing might explain the long application of full deposit insurance in Turkey. This issue should be further studied.

References

- Angbazo, L. "Commercial Bank Net Interest Margins, Default Risk, Interest Rate Risk and Off-balance Sheet Banking." *Journal of Banking and Finance* 21 (1997), 55-87.
- Baer, L. and Brewer "Uninsured Deposits as a Source of Market Discipline: Some New Evidence." *Federal Reserve Bank of Chicago Economic Perspectives* September/October (1986), 23-31.
- Barajas, A. and R. Steiner. "Depositor Behavior and Market Discipline in Colombia." Working Paper 00/214, International Monetary Fund, 2000.
- Berger, A.N. and G.F. Udell. "Relationship Lending and Lines of Credit in Small Firm Finance Author." *Journal of Business* 68 (1995), 351-81.
- Bhattacharya, S., W.A. Boot, and A.V. Thakor. "The Economics of Bank Regulation." *Journal of Money Credit and Banking* 30 (1998), 745-770.
- Cargill, T.F. "CAMEL Ratings and the CD Market." *Journal of Financial Services Research* 30 (1989), 347-358.
- Chen, Y. "Banking Panics: The Role of the First-Come, First-Served Rule and Information Externalities." *Journal of Political Economy* 107 (1999), 946-968.
- Cornett, M.M., E. Ors and H. Tehranian. "Bank Performance around the Introduction of a Section 20 Subsidiary." *The Journal of Finance* 57 (2002), 501-521.
- Cull, R., L.W. Senbet, and M. Sorge. "The Effect of Deposit Insurance on Financial Depth: A Cross-Country Analysis." *Quarterly Review of Economics and Finance* 42 (2002), 673-694.
- Demirgüç-Kunt, A. and E. Detragiache. "Does Deposit Insurance Increase Banking System Stability? An Empirical Investigation." *Journal of Monetary Economics* 49 (2002), 1373-1406.
- Demirgüç-Kunt, A. and E. Kane. "Deposit-insurance around the globe:

- where does it work?” *Journal of Economic Perspectives* 16 (2002), 175-195.
- Demirgüç-Kunt, A. and T. Sobacı. “Deposit Insurance Around the World: A Database.” *World Bank Economic Review* 15 (2002), 481-490.
- Diamond, D.W. and P.H. Dybvig. “Bank Runs, Deposit Insurance and Liquidity.” *Journal of Political Economy* 91 (1983), 401-419.
- Ellis, D. and M.J. Flannery. “Does the debt Market Assess Large Banks’ Risk?: Time Series Evidence From Money Center CDs.” *Journal of Monetary Economy* 30 (1992), 481-502.
- Flannery, M.J. and S.M. Sorescu. “Evidence of Bank Market Discipline in Subordinated Debenture Yields: 1983- 1991.” *Journal of Finance* 51 (1996), 1347-1377.
- Garcia, G. “Deposit Insurance: A Survey of Actual and Best Practices.” Working Paper 99/54, International Monetary Fund, 1999.
- Goldberg, L.G. and S.C. Hudgins. “Depositor Discipline and Changing Regulatory Strategies in the Thrift Industry.” *Journal of Financial Economics* 63 (2002), 263-274.
- Grossman, R. S. “Deposit Insurance, Regulation, and Moral Hazard in the Thrift Industry: Evidence from the 1930’s.” *American Economic Review* 82 (1992), 800-821.
- Hannan, T.H. and G.A. Hanweck. “Bank Insolvency Risk and the Market for Large Certificates of Deposit.” *Journal of Money Credit and Banking* 20 (1988), 203-211.
- Karels, G.V. and C.A. McClatchey. “Deposit Insurance and Risk-Taking Behavior in the Credit Union Industry.” *Journal of Banking and Finance* 23 (1999), 105-134.
- Martinez Peria, M.S. and S.L. Schmukler. “Do Depositors Punish Banks for Bad Behavior? Market Discipline, Deposit Insurance and Banking Crises.” *The Journal of Finance* 56 (2001), 497-514.

Park, S. "Market Discipline by Depositors Evidence from Reduced Form Equations." *Quarterly Review of Economics and Finance* 35 (1995), 1029-1051.

Park, S. and S. Peristiani. "Market Discipline by Thrift Depositors." *Journal of Money, Credit, and Banking*, 30 (1998), 347-64.

Rojas-Suarez, L. "Rating Banks In Emerging Markets: What Credit Rating Agencies Should Learn From Financial Indicators." Working Paper, Institute for International Economics, 2001

Slovin, M.B., M.E. Sushka, J.A. Polonchek "The Value of Bank Durability: Borrowers as Bank Stakeholders." *Journal of Finance* 48 (1993), 247-266.

Wong, P. K. "On the Determinants of Bank Interest Margins under Credit and Interest Rate Risks." *Journal of Banking and Finance* 21 (1997), 251-71.